Course Syllabus

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Introduction

Transportation is probably the biggest driver of the shape of our cities. Cities exist because they are the best mechanism humans have developed for bringing people together. The more people meet, the more they develop ideas, grow organizations, build culture, and trade.

Cities developed as we went from designing for pedestrians to designing for trains and streetcars to designing for cars. Now, the shape of cities is evolving again as we try to design "complete streets" that accommodate pedestrians, bikes, and transit. All of this is a continuing discussion between engineers, planners, and architects. Engineers take the lead in designing transportation, however you cannot design good transportation infrastructure without thinking of planning, architecture, and urban design.

The key to understanding any mode of transportation, is understanding its geometry. The geometry of trains — their length, the curve radii and grades they require — drove the design of the Victorian City. The geometry of cars — lane widths, intersection layouts, and highway grade separation — drives the design of today's cities. On a large scale, transit depends on the geometry of networks and connections. The design standards, like the AASHTO Green Book, that sets this geometry are essentially the DNA of the urban landscape.

We cannot understand transportation with being comprehensive in terms of modes: roadways, pedestrians, bikes, transit, planes, shipping, and freight as well as passengers. That includes thinking about how these modes interface and work with one another, since that is increasingly the way the world works. A container going from a factory in China to a warehouse in Texas moves from truck, to ship, to truck, to train, to truck, but to the shipper it is all one-supply chain.

In this semester, we will look at the history of transportation modes in the context of the history of cities. We will look at how we conceive and implement transportation infrastructure. We will visit some local transportation infrastructure. But, this is at heart a design class. It is not possible to in one semester become a traffic engineer. It is possible to learn enough about roadway design to, given a specific right-of-way width, come up with a few alternate cross sections for a road and analyze the pros and cons of each. It is possible to learn enough about how a rail station works to lay out a set of tracks and platforms and think about how to fit them into a city.

Class Outline and Learning Objectives

- Introduction: Transportation and Cities
- Pedestrians
- Bicycles
- Cars and Trucks

- Trains
- Transit Networks
- Ships
- Planes
- Conclusion: Organizations, Engineers, Planners, and Architects

Upon completion of this sequence, a student is expected to:

- Understand the fundamental characteristics of the most common transportation modes
- Understand the role different transportation modes serve today
- Understand how the design of transportation systems shapes cities
- Be able to sketch "back of the envelope" designs for pedestrian, bicycle, and car infrastructure and transit networks
- Be aware of the systems by which transportation projects are designed, funded, built, maintained, and operated in the United States.

Grading

Class grade is based on:

- Assignments (30 %)
- Final project (30 %)
- Midterm / Exam (30 %)
- Attendance (10 %)

Late assignments and projects drop one letter grade.

The grading scale is as follows:

97% or above: A +

93%-96.9%: A

90%-92.9%: A-

87%-89.9%: B+

83%-86.7%: B

80%-82.9%: B-

77%-79.9%: C+

73%-76.7%: C

70%-72.9%: C-

67%-69.9%: D+

63%-66.7%: D

60%-62.9%: D-

59.9% or below: F

This range may be adjusted downwards but not upwards.

Assignments

There will be homework assignments through the semester. Assignments will include writing, graphic documentation, and oral presentation. Assignments will be graded for writing and presentation as well as content.
There will be two kinds of assignments:

- A transportation autobiography, which every student must complete
- Transportation audits. There are 5 of these (walk, bike, drive, transit, fly) and each student must complete two of the five audits and present them in class. There is a limited number presentation slots, and each presentation day is limited to specific audits. Students can sign up for presentation slots on Canvas, and should sign up as soon as possible to ensure they have the audits of their choice.

The transportation audits involve going off campus, which will involve risks that sitting in a class on campus does not. Audits will involve physical activity, including walking and bicycling. They will also require students to navigate the city by themselves. A release form will be required. Any student who is not comfortable with a particular audit should select a different audit. Students participate at their own risk, and neither Rice nor the instructors are responsible for student safety.

Assignments cannot be re-submitted; the first submission on Canvas is final. Assignments not submitted on time will be penalized.

Final Project

A final project will be assigned mid-way through the semester and due at the end of the semester.

Exam

There will be an exam and a midterm covering the material in the books and in the lectures. The midterm will cover the introductory lecture, pedestrians, bicycles, and cars. The final will have two sections, the first covering the same material as the midterm and the second covering the rest of the class.

The midterm will not count towards the class grade; only the final will. However, if the score on the midterm

is higher than the score on the first section of the final, the midterm score will be counted, resulting in a higher grade on the final.

Both the final and the midterm are take-home, administered on Canvas and available anywhere with an internet connection. The final exam will be available for the duration of the exam period.

Attendance

The attendance portion of the class will be graded as follows:

3 or fewer absences - full credit

4, 5 or 6 absences - 50% credit

More than 6 absences - no credit

Accommodations may be made for illness or academic-related absences. If you will miss class for these reasons, e-mail both of us with "Absence" in the subject line before class starts. It will be difficult to do well on the exam without attending the lectures. Any student who will miss a class can contact us for alternatives.

In-class Design Exercises

Group design activities will be scheduled during the regular class time.

Field Trips

Field trips will be scheduled outside of regular class times. Students will get extra credit equivalent to 1% of the total course grade for each field trip they attend.

By their nature, field trips involve going off campus, which will involve risks that sitting in a class on campus does not. Field trips will involve physical activity, including walking and bicycling. Some field trips may have off-campus meeting points and require students to navigate the city by themselves. A release form will be required. Any student who is not comfortable with a field trip should not take part. Students participate at their own risk, and neither Rice nor the instructors are responsible for student safety.

Students can also get extra credit by doing one of two things:

- Attending an off-campus lecture or talk on a transportation topic and then submitting a few paragraphs on Owlspace about the event and what you found interesting or learned. Each lecture counts for extra credit equivalent to 1% of the class grade. On-campus lectures targeted at the greater Houston community (such as Kinder Institute events) may also be eligible for credit; email the instructors in advance to see if they will qualify.
- Attending a public meeting about a transportation project, and then submitting a few paragraphs on

Owlspace (about the event and what you found interesting or learned.) Each event counts for extra credit equivalent to 1% of the total class grade.
Students may receive extra credit for up to 3 field trips and /or events, up to 3% total.

Honor Code

The extent of collaboration permitted on each assignment, project, and exam will be indicated with that assignment, project, or exam.

Accommodations for Disability

Any student with a documented disability seeking academic adjustments or accommodations is requested to speak to the instructor during the first two weeks of class. All such discussions will remain as confidential as possible. Students with disabilities will need to also contact Disability Support Services in the Allen Center.

Contact Information

Christof Spieler may be reached as follows:

email: spieler@rice.edu

Text or call: (832) 687-1613

Armandina (Mandi) Chapa may be reached as follows:

e-mail: mandi.chapa@rice.edu

Text or call: (281) 650-8371

We have no standing office hours and no on-campus office, but we are happy to schedule appointments on campus.

Prerequisites

This class is open to students of any major. There are no prerequisites.

Textbooks

The following texts are assigned for the class:

- "Walkable City: How Downtown Can Save America, One Step at a Time," Jeff Speck, 2013 (http://amzn.com/0865477728)
- "Divided Highways: Building the Interstate Highways, Transforming American Life," Tom Lewis, 2013 (http://amzn.com/0801478227)
- "Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives," Jarrett Walker, 2011 (http://amzn.com/1597269727)

Texts are available in the library or may be purchased on Amazon in paper or e-book format. All texts are on reserve at Fondren.

In addition, two books are available online but can be purchased by anyone who wants a hard copy:

"Urban Street Design Guide," NACTO, 2013, available at **https://nacto.org/publication/urban-street-design-guide/ (https://nacto.org/publication/urban-street-design-guide/)** (**https://www.amazon.com/Street-National-Association-Transportation-Officials/dp/1610914945 (https://www.amazon.com/Street-National-Association-Transportation-Officials/dp/1610914945)**)

"Trains, Buses, People," Christof Spieler, 2018. Excerpts will be posted. (**https://www.amazon.com/Trains-Buses-People-Opinionated-Transit/dp/1610919033 (https://www.amazon.com/Trains-Buses-People-Opinionated-Transit/dp/1610919033)**)

Course Summary:

Date	Details	
Thu Jan 16, 2020	**Assignment 1: Transportation Autobiography (https://canvas.rice.edu/courses/30283/assignments/137127)**	due by 5am
Tue Jan 28, 2020	**Assignment 2: Walk Audit (https://canvas.rice.edu/courses/30283/assignments/137128)**	due by 5am
	Audit presentations (Walk) (https://canvas.rice.edu/appointment_groups/1104)	8am to 9:12am
Thu Feb 6, 2020	**Assignment 3: Bike Audit (https://canvas.rice.edu/courses/30283/assignments/137129)**	due by 5am
	Audit presentations [Walk, Bike] (https://canvas.rice.edu/appointment_groups/1106)	8am to 9:12am

Thu Feb 20, 2020	Assignment 4: Drive Audit (https://canvas.rice.edu/courses/30283/assignments/137130)	due by 5am
	Audit presentations [Walk, Bike, Drive] (https://canvas.rice.edu/appointment_groups/1107)	8am to 9:12am
Thu Feb 27, 2020	Audit presentations [bike, drive] (https://canvas.rice.edu/appointment_groups/1109)	8am to 9:12am
Thu Mar 5, 2020	Assignment 5: Transit Audit (https://canvas.rice.edu/courses/30283/assignments/137131)	due by 5am
	Audit presentations [drive, transit] (https://canvas.rice.edu/appointment_groups/1108)	8am to 9:12am
Thu Mar 26, 2020	Assignment 6: Flight Audit (https://canvas.rice.edu/courses/30283/assignments/137132)	due by 5am
	Audit presentations [transit, fly] (https://canvas.rice.edu/appointment_groups/1110)	8am to 9:12am
Thu Apr 2, 2020	Audit presentations [transit, fly] (https://canvas.rice.edu/appointment_groups/1111)	8am to 9:12am
Mon Apr 13, 2020	Final Project Presentations (https://canvas.rice.edu/courses/30283/assignments/137136)	due by 5pm
Fri Apr 17, 2020	Extra Credit (https://canvas.rice.edu/courses/30283/assignments/137134)	due by 11:59pm
Wed May 6, 2020	Final Exam (https://canvas.rice.edu/courses/30283/assignments/137126)	due by 11:59pm
	Final Project (https://canvas.rice.edu/courses/30283/assignments/137135)	due by 11:59pm
	Roll Call Attendance (https://canvas.rice.edu/courses/30283/assignments/137137)	